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Effect of phase transitions of helium-3 in pores of wood carbonizate on the spin kinetics of 3He nuclei

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Abstract

The time of the nuclear magnetic relaxation of 3He gas in pores of Astronium carbonizate powder is studied as a function of gas pressure. Using the results of the measurements of the spin-echo amplitude, the dependences of the rates of spin-lattice and spin-spin relaxations on the number of helium atoms on the surface, in pores, and in the interparticle space of carbonizate powder have been determined. Analysis of the relaxation rates allows the identification of three possible basic phases of 3He in the system under consideration: solid film, gas phase, and liquid. Moreover, the character of spin kinetics in transitions between these phases has been determined. © Pleiades Publishing, Inc., 2006.

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